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EXAMINER

UMEZ ERONINI, LYNETTE T

ART UNIT	PAPER NUMBER
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1765

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DATE MAILED: 05 21 2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/842,769

Applicant(s)

HAGIHARA ET AL

Examiner

Lynette T Umez-Eronini

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) 1-12 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 13-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(b).

## Attachments

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statement (PTO-111) (Required)
4. ☐ Interview Summary (PTO-413) (Paper No.)
5. ☐ Notice of Informal Patent Application (PTO-152)

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election of Group II in Paper No. 5 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

### ***Specification***

2. The disclosure is objected to because of the following informalities: Throughout the Specification, "(B) one or more compounds selected from polycarboxylic acids having 4 or more carbon atoms and having either OH or group or groups or SH group or groups, monocarboxylic acids having 1 to 20 carbon atoms, and dicarboxylic acids having 2 to 3 carbon atoms, and salts thereof" has been mentioned. However, the characteristic of a carboxylic acid is it contains an "OH" group. Appropriate correction is required.

### ***Claim Objections***

3. Claims 14-18 are objected to because of the following informalities: "(B) one or more compounds selected from polycarboxylic acids having 4 or more carbon atoms

having 1 to 20 carbon atoms, and dicarboxylic acids having 2 to 3 carbon atoms, and

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salts thereof" fail to differentiate carboxylic acids because the characteristic of a carboxylic acid is it contains an "OH" group. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 14 and 17-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 14, "one or more compounds selected from carboxylic acids . . .";

In claim 14, "one or more compounds selected from polycarboxylic acids . . .";

In claim 14, "one or more compounds selected from an intermediate . . .";

In claim 17, "one or more compounds selected from carboxylic acids . . .";

In claim 17, "one or more compounds selected from polycarboxylic acids . . .";

In claim 18, "one or more compounds of Compounds (A) are selected from carboxylic acids . . .";

In claim 18, "one or more compounds of Compounds (B) are selected from polycarboxylic . . .";

In claim 19, "one or more compounds of Compounds (A) are selected from carboxylic acids . . ." and

polycarboxylic . . . is indefinite because of improper use of Markush language

It is suggested the claims be rewritten, for example, --one of more compounds selected from the group consisting of-- carboxylic acids having 2 to 20 carbon atoms . . . . monocarboxylic acids having . . . . dicarboxylic acid having . . . . and salts thereof."

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claim 13 is rejected under 35 U.S.C. 102(b) as being anticipated by Kaufman et al. (US 5,783,489).

Kaufman teaches, ". . . a method for using the chemical polishing slurry to remove titanium . . . from a substrate" (Abstract). "The CMP slurry of this invention includes **an abrasive**. The abrasive is typically a metal oxide abrasive. The metal oxide abrasive may be selected from the group including **alumina**, titania, zirconia, germania, silica, ceria and mixtures thereof" (column 4, lines 46-50). "The metal oxide abrasive may be produced by any techniques known to those skilled in the art. Metal oxide abrasives can be produced using any high temperature process such as sol-gel, hydrothermal or, plasma process, or by processes for manufacturing fumed or precipitated metal oxides. Preferably, the metal oxide is a fumed or precipitated

alumina abrasive. The abrasives of applicant's invention are alumina" (column 4, lines 55-60).

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Kaufman further teaches, "Preferably, the metal oxide abrasive is incorporated into the aqueous medium of the polishing slurry as a concentrated aqueous dispersion of metal oxides, . . . The aqueous dispersion of metal oxides may be produced utilizing conventional techniques, such as slowly adding the metal oxide abrasive to an appropriate media, for example, deionized **water** . . ." (column 5, lines 63).

Kaufman also teaches, "The CMP slurry of this invention includes an organic acid. . . . "the CMP slurry of the present invention to enhance the selectivity to oxide polishing rate, such as **monofunctional acids, di-functional acids, hydroxyl/carboxylate acids**, chelating, non-chelating acids, and their salts. Preferably, the organic acid is selected from the group of **acetic acid** (same as applicants monocarboxylic acid having 1 to 20 carbon atoms), adipic acid, butyric acid, capric acid, caproic acid, caprylic acid, citric acid, glutaric acid, glycolic acid, formic acid, fumaric acid, lactic acid, lauric acid, malic acid, maleic acid, malonic acid, myristic acid, **oxalic acid**, (same as applicant's dicarboxylic acid having 2 to 3 carbon atoms), palmitic acid, phthalic acid, propionic acid, pyruvic acid, stearic acid, succinic acid, tartaric acid, valeric acid and derivatives, including **salts thereof**" (column 6, lines 1-14). which reads on applicant's roll-off reducing agent). All of the aforementioned reads on,

A process for producing a substrate comprising a step of polishing a substrate to be polished with a polishing composition comprising:

1. abrasives;

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a roll-off reducing agent comprising one or more compounds selected from the group consisting of carboxylic acids having 2 to 20 carbon atoms having either OH or group or groups or SH group or groups, monocarboxylic acids having 1 to 20 carbon atoms, and dicarboxylic acids having 2 to 3 carbon atoms, and salts thereof; and

an intermediate alumina, **in claim 13.**

8. Claims 14-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Kaufman ('489).

Kaufman teaches, "... a method for using the chemical polishing slurry to remove titanium ... from a substrate" (Abstract). "The CMP slurry of this invention includes **an abrasive**. The abrasive is typically a metal oxide abrasive. The metal oxide abrasive may be selected from the group including **alumina**, titania, zirconia, germania, silica, ceria and mixtures thereof" (column 4, lines 46-50). "The metal oxide abrasive may be produced by any techniques known to those skilled in the art. Metal oxide abrasives can be produced using any high temperature process such as sol-gel, hydrothermal or, plasma process, or by processes for manufacturing fumed or precipitated metal oxides. Preferably, the metal oxide is a fumed or precipitated abrasive and, more preferably it is a fumed abrasive such as fumed silica or fumed alumina (which reads on applicant's intermediate alumina)" (column 4, lines 55-60).

Kaufman further teaches, "Preferably, the metal oxide abrasive is incorporated

metal oxides. The aqueous dispersion of metal oxides may be produced utilizing

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conventional techniques, such as slowly adding the metal oxide abrasive to an appropriate media, for example, deionized water . . ." (column 5, lines 63).

Kaufman also teaches, "The CMP slurry of this invention includes an organic acid. . . . "the CMP slurry of the present invention to enhance the selectivity to oxide polishing rate, such as **monofunctional acids, di-functional acids, hydroxyl/carboxylate acids**, chelating, non-chelating acids, and their salts. Preferably, the organic acid is selected from the group of **acetic acid** (same as applicant's monocarboxylic acid having 1 to 20 carbon atoms), adipic acid, butyric acid, capric acid, caproic acid, caprylic acid, citric acid, **glutaric acid** (same as applicant's polycarboxylic acid having 4 or more carbon atoms and having neither OH group(s) groups nor SH group(s)), glycolic acid, formic acid, fumaric acid (same as applicant's polycarboxylic acid having 4 or more carbon atoms and having neither OH group(s) groups nor SH group(s)), lactic acid, lauric acid, malic acid, maleic acid (same as applicant's polycarboxylic acid having 4 or more carbon atoms and having neither OH group(s) groups nor SH group(s)), malonic acid, myristic acid, **oxalic acid**, (same as applicant's dicarboxylic acid having 2 to 3 carbon atoms), palmitic acid, phthalic acid, propionic acid, pyruvic acid, stearic acid, succinic acid, tartaric acid, valeric acid and derivatives, including **salts thereof**" (column 6, lines 1-14), which reads on applicant's roll-off reducing agent). The aforementioned reads on,

A process for producing a substrate comprising a step of polishing a substrate to



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(A) one or more compounds selected from the group consisting of carboxylic acids having 2 to 20 carbon atoms having either OH or group or groups or SH group or groups, monocarboxylic acids having 1 to 20 carbon atoms, and dicarboxylic acids having 2 to 3 carbon atoms, and salts thereof;

(B) one or more compounds selected from polycarboxylic acids having 4 or more carbon atoms and having either OH or group or groups or SH group or groups, monocarboxylic acids having 1 to 20 carbon atoms, and dicarboxylic acids having 2 to 3 carbon atoms, and salts thereof;

(C) one or more compounds selected from an intermediate alumina and an alumina sol;

an abrasive; and

water, **in claims 14.**

Kaufman further teaches, "the metal oxide abrasive may consist of discrete, individual metal oxide particles having a primary particle diameter less than 0.4 micron (400 nm) and a surface area ranging from about 10 m<sup>2</sup>/g to about 250 m<sup>2</sup>/g. . . ." (column 4, lines 50-54), which reads on ,

wherein the intermediate alumina and the alumina sol in Compounds (C) have a specific surface area of from 30 to 300 m<sup>2</sup>/g and an average particle size of 0.01 to 5 μm, **in claim 15** and encompasses applicant's range or both surface area and average particle size.

ndustry the preferred metal oxide should be of a high purity. High purity means that

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the total impurity content, from sources such as raw material impurities and trace processing contaminants, is typically less than 1% and preferably less than 0.01% (i.e., 100 ppm)" (column 5, lines 50-54), which reads on,

wherein the intermediate alumina is prepared from aluminum hydroxide and/or alumina sol each having a specific surface area of 10 m<sup>2</sup>/g or more and encompasses applicant's specific surface area. Since Kaufman's alumina is used in the same polishing slurry and polishing method as that of the claimed invention, then using Kaufman's alumina would inherently have a content of an alkali metal and a content of an alkaline earth metal of 0.1 % by weight or less **as in claim 16**.

9. Claims 17-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Kaufman (489).

As pertaining to claims 17-19, Kaufman teaches, "... a method for using the chemical polishing slurry to remove titanium ... from a substrate" (Abstract). "The CMP slurry of this invention includes **an abrasive**" (column 4, line 46). "Preferably, the metal oxide abrasive is incorporated into the aqueous medium of the polishing slurry as a concentrated aqueous dispersion of metal oxides, ... The aqueous dispersion of metal oxides may be produced utilizing conventional techniques, such as slowly adding the metal oxide abrasive to an appropriate media, for example, deionized water ... (column 5, lines 63).

and ... the CMP slurry of the present invention to enhance the selectivity to oxide

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polishing rate, such as **monofunctional acids**, **di-functional acids**, **hydroxyl/carboxylate acids**, chelating, non-chelating acids, and their salts. Preferably, the organic acid is selected from the group of **acetic acid** (same as applicant's monocarboxylic acid having 1 to 20 carbon atoms), adipic acid, butyric acid, capric acid, caproic acid, caprylic acid, citric acid, **glutaric acid** (same as applicant's polycarboxylic acid having 4 or more carbon atoms and having neither OH group(s) groups nor SH group(s)), lactic acid, lauric acid, malic acid, maleic acid (same as applicant's polycarboxylic acid having 4 or more carbon atoms and having neither OH group(s) groups nor SH group(s)), malonic acid, myristic acid, **oxalic acid**, (same as applicant's dicarboxylic acid having 2 to 3 carbon atoms), palmitic acid, phthalic acid, propionic acid, pyruvic acid, stearic acid, succinic acid, tartaric acid, valeric acid and derivatives, including **salts thereof**" (column 6, lines 1-14), which reads on applicant's roll-off reducing agent). The aforementioned reads on,

A process for producing a substrate comprising a step of polishing a substrate to be polished with a polishing composition comprising:

A process for producing a substrate comprising a step of polishing a substrate to be polished with a polishing composition comprising:

(A) one or more compounds selected from the group consisting of carboxylic acids having 2 to 20 carbon atoms having either OH or group or groups or SH group or groups, monocarboxylic acids having 1 to 20 carbon atoms, and dicarboxylic acids

(B) one or more compounds selected from polycarboxylic acids having 4 or more carbon atoms and having either OH or group or groups or SH group or groups, monocarboxylic acids having 1 to 20 carbon atoms, and dicarboxylic acids having 2 to 3 carbon atoms, and salts thereof;

an abrasive; and

water.

### ***Conclusion***

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

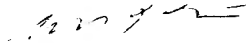
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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynette T. Umez-Eronini whose telephone number is 703-306-9074. The examiner is normally unavailable on the First Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin Utech can be reached on 703-308-3836. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

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May 17, 2003

  
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